

REMARKS

This Amendment is submitted in response to the Official Letter dated May 26, 2004, in which the Examiner rejected Claims 6-10 and 22-31. The Specification has been amended to more clearly state one aspect of the present invention by including conventional definitions of working flux gaps and non-working flux gaps. No new matter has been added. Claims 27, 30, and 31 have also been amended to more clearly define the invention. Applicants request reconsideration of these Claims in light of the amendments and the remarks submitted below. Thus, Claims 6-10 and 22-31 are pending and remain for consideration.

The Examiner rejected Claims 27, 30, and 31 under 35 U.S.C. 103(a) as being anticipated by U.S. Patent 5,110,087 to Studtmann et al. (hereinafter Studtmann) in view of U.S. Patent 4,553,121 to Logie, U.S. Patent 4,097,833, and/or U.S. Patent 4,334,205 to Seilly. Applicants respectfully disagree. The Examiner views Studtmann as showing one radial armature shoulder G which defines a first lateral flux gap G-G with a first pole shoulder. The Examiner also views Studtmann as showing a second armature "shoulder" F defining a second lateral flux gap F-F with a second pole shoulder. Studtmann only shows one radial shoulder gap (G-G) that results in a radial or lateral magnetic force. The gap F-F is not a lateral gap as is specifically claimed. The gap F-F is between faces of an armature and a pole piece, not between shoulders and is therefore an axial gap. Thus, the magnetic force between them is in an axial direction, not lateral. This is also specifically recited in Studtmann, particularly at Column 11, Lines 14-15, the air gap F-F is defined as "an axial air gap". At Column 11, Lines 24-25, the air gap G-G is defined as "a radial working gap". The first and second lateral flux gaps of the claimed invention are of the shoulder design and are lateral gaps, that is, situated at or on the side. Thus, the axial gap F-F cannot be a lateral gap as is recited in the Applicants' claims. Similarly, with respect to Claims 30 and 31, the gap R-R is a face to face gap and thus, the same remarks about the gap F-F also apply to the gap R-R. Also, gaps R-R and G-G are not formed in a stepped relation to each other as claimed, shown in the Figures, and described in the Specification, but rather are positioned perpendicularly to each other.

In addition, Studtmann does not disclose the flux ring as it is claimed by the Applicants. The Examiner states that the housing 212 is the same as the flux ring of the Applicants' invention. However, the housing 212 cannot be the same as the Applicants' flux ring. The gap R-R between the housing 212 and the armature 220 is a non-working gap as the reluctance of the gap R-R remains substantially constant throughout the range of motion of the armature 220. Thus, the gap R-R is not a "third working lateral flux gap" as is now claimed. The interpretation presented by the Examiner is, therefore, contrary to the Applicants' invention in that the flux ring is used to define the third flux gap between the step (530) of the armature and the flux ring. The third gap is defined as a lateral gap. In the "triple gap" system that is claimed, the gaps work to increase the overall force that is operating on the valve armature while maintaining a relatively linear force versus displacement operating curve for the control valve system. Studtmann does not show this third lateral gap (as was explained above) and therefore does not utilize, show or suggest the need for a flux ring to define such a gap. Based on the foregoing, Studtmann does not anticipate or make obvious the Applicants' invention as defined by the Applicants' claims.

In addition, the Examiner submits that Logie, Myers and Seilly disclose multiple stepped lateral flux gaps and that it would have been obvious to one skilled in the art to adapt the disclosure of Studtmann to incorporate the stepped features of Logie, Myers, and/or Seilly. The Applicants respectfully disagree. With respect to Logie and Seilly, neither shows such a structure to increase the useful output force of the valve. The structure of Seilly indicates that the stepped structure is only used to maximize the attractive area of the pole pieces. However, the attractive force between the pole pieces will only create an action that is similar to two pole pieces attracting each other. There will be no lateral flow components that increase the useful force within the device. Similarly, with Logie, there is only the use of classic "E-I" shaped solenoids, which is known in the art and presents nothing related to the use of a stepped gap armature as is claimed. In addition, the structure of Logie does not create a change in permeance with the implementation of any of the air gaps. Thus, there is

no additional force producing gap, the gaps only allow for basic magnetic coupling and creation of a "magnetic circuit".

With respect to Myers, the two or more stepped gaps recited in the claims do not appear to be shown, despite the assertion of the Examiner, and thus Myers appears to be non-pertinent with respect to the Applicants' invention as claimed.

Since the working lateral flux gaps claimed by the Applicants are not shown or suggested by any of the references cited by the Examiner, the Applicants request withdrawal of the rejections of Claims 27 and 30. Since Claims 28 and 29 depend from Claim 27, those claims should be allowable as well, for at least that reason in addition to the reasons stated above. Similarly, Claim 31 depends from Claim 30 and should be allowable for at least that reason.

The Examiner also rejected Claims 6-10, 22-26, 28 and 29 under 35 U.S.C. 102(b) as being obvious over U.S. Patent 5,503,184 to Reinartz et al. (hereinafter Reinartz) in view of Studtmann, Logie, Myers, and Seilly. However, the remarks above also apply to the references the Examiner applies to independent Claim 6.

Additionally, with respect to the Examiner's use of Myers, Logie and Seilly in combination with Studtmann, the Federal Circuit has consistently said that in order for references to be properly combined they must contain some teaching or suggestion of the proposed combination. In *Panduit v. Dennison Manufacturing Co.*, 1 U.S.P.Q.2d 1593, 1597 (Fed. Cir. 1987), the Federal Circuit reviewed the District Court's finding that a plastic cable tie was obvious based on prior art under 35 U.S.C. 103. The District Court had concluded that Panduit's cable tie was obvious because its components had separately appeared in prior patents. The Federal Circuit noted that the District Court, "improperly treated all cable ties as virtually interchangeable" *Panduit* at 1600. In reversing the District Court, the Federal Circuit noted that the prior art as a whole must suggest the combination claimed in the application; and "hindsight reconstruction from similar elements in separate prior patents would necessarily destroy virtually all patents and cannot be the law under 35 U.S.C. 103." *Panduit* at 1603, citing, *Akzo N.V. v. International Trade Commission*, 1 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1986), and *W.L.*

Gore & Associates, Inc. v. Garlock, 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 461 (1984).^{1/}

Here, the rejection is treating all references involving magnetic armatures with any form of step as interchangeable and attempting to recreate the Applicants' invention based on "hindsight reconstruction." There is nothing in any of the references that enables the combination of the hydraulic control valve of Studtmann with the armatures, cores and other components of Logie, Myers and Seilly. With respect to Claim 6, none of the references show or suggest the flux ring of the Applicants' invention. Even if Studtmann shows a flux ring, it is not readily apparent from the references as to how they would operate within such a structure. Additionally, with respect to Claim 6, there is no disclosure or suggestion of how the components of Logie, Myers and Seilly can be used to cooperate with the pressure boundary and armature to form the lateral flux gaps as shown and described by the Applicants. In fact, such a combination could not be made without a substantial impact on the performance of the mechanisms as disclosed in their respective patents. In particular, by disposing an armature within a pressure boundary created by a sleeve and with a coil disposed outside the sleeve, as is specifically claimed, the movable components of the devices of Logie, Myers and Seilly would be separated from the coils and there is no showing or suggestion as to how they could operate if such a separation were made. Therefore, the references cannot properly be combined.

Thus, for at least these reasons, the Applicants request withdrawal of the rejections. Since Claims 7-10 and 22-26 depend from Claim 6, those claims should be allowable as well, for at least that reason.

In view of the foregoing amendment, remarks and arguments, it is believed that Claims 6-10 and 22-31 are in condition for allowance. Therefore, the Applicants contend that all of the pending claims are patentable over the Examiner's rejections, and request reconsideration and withdrawal of the rejection of the Claims.

^{1/} See also, *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984); *Carella v. Starlight Archery, Inc.*, 231 U.S.P.Q. 644, 647 (Fed. Cir. 1986); and *Fromson v. Advance Offset Plate, Inc.*, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985).